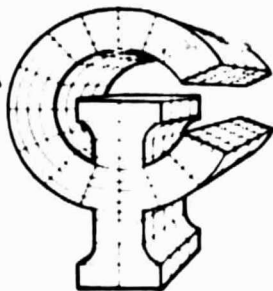


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CONTINUUM, INC.

4715 UNIVERSITY DRIVE - SUITE 118

HUNTSVILLE, ALABAMA 35805

(205) 837-9310

April 10, 1984

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
ATTN: ED14/Harbison
Marshall Space Flight Center, AL 35812

Dear Mr. Harbison:

Enclosed is the Monthly Progress Report (original and six copies) for the period of March 1 - March 31, 1984, in compliance with the requirements of Contract No. NAS8-35508. Distribution of this report has been made as noted below. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Richard C. Farmer
NASA Projects Director



Enc.

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NASA Scientific and Technical Information Facility ✓

(NASA-CR-171114) COMPUTATIONAL FLUID
MECHANICS UTILIZING THE VARIATIONAL
PRINCIPLE OF MODELING DAMPING SEALS Monthly
Progress Report, 1 Mar. - 31 Mar. 1984
(Continuum, Inc.) 3 p HC A02/RF A01

N84-31553

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**COMPUTATIONAL FLUID MECHANICS UTILIZING
THE VARIATIONAL PRINCIPLE OF MODELING DAMPING SEALS**

Monthly Progress Report, Contract No. NAS8-35508
for March 1 - March 31, 1984

Prepared for:

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

By:

Continuum, Inc.
4715 University Drive, Suite 118
Huntsville, AL 35805
April 10, 1984

MONTHLY PROGRESS REPORT, Contract No. NAS8-35508 (For the period of March 1 - March 31, 1984).

Objective:

The objective of this research is to develop and verify a computational fluid mechanics model which simulates the damping seals that are being considered for use in the SSME turbomachinery.

Work performed during this reporting period:

The pressure solution for incompressible flow is still under study. Of several models investigated, two have been identified as the most promising for 3-dimensional, time-dependent problems. One is an implicit solution of the mechanical energy equation, and the second is the use of artificial compressibility modified for a time-accurate solution. The compatibility of these solutions with the variational principle is also being studied.

Work to be performed during next reporting period:

The two pressure models that have been selected are to be studied further. These will be programmed into the VARI code. The method of solving the momentum and continuity equations, since one momentum equation is no longer used for pressure, will also be examined.

Current Problems:

No problems which would preclude the timely completion of this study have been encountered to date.

Total cumulative expenditures incurred as of this date:

Total cumulative costs incurred from contract inception through the end of this reporting period are: \$ 20,304 representing 16% of the costs allocated for this study.

Estimated percentage of physical completion of contract:

Of the man hours allocated for this study, 16% have been expended, and 16% of the physical effort has been completed.